

<b>CERTIFICATE OF TRANSMISSION BY FACSIMILE (37 CFR 1.8)</b>				Docket No. DP-304592/DE3-0214
Applicant(s): Reeny T. Sebastian et al.				
Application No. 09/989,486	Filing Date November 20, 2001	Examiner Brian J. Broadhead	Group Art Unit 3661	
<b>Invention:</b> Rear Steering Sensor Diagnostic Algorithm For Four-Wheel Steering Systems				
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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: REENY T. SEBASTIAN ET AL. )  
SERIAL NUMBER: 09/989,486 ) Group Art Unit: 3661  
FILED: NOVEMBER 20, 2001 )  
FOR: REAR STEERING SENSOR ) Before the Examiner:  
DIAGNOSTIC ALGORITHM FOR ) BRIAN J. BROADHEAD  
FOUR-WHEEL STEERING )  
SYSTEMS )

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

RESPONSE

This Response is responsive to the Notification of Non-Compliant Appeal Brief dated September 27, 2006. The Appeal Brief is resubmitted herewith and has been revised to include the Evidence Appendix and Related Proceedings Appendix, as indicated in the Notification.

It is believed that the Appeal Brief is now in full compliance with 37 C.F.R. 41.37, whereby entry thereof is respectfully requested.

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If there are any additional charges with respect to this Amendment or otherwise,  
please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorney.

Respectfully submitted,

REENY T. SEBASTIAN ET AL.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: REENY T. SEBASTIAN ET AL. )  
   )  
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SERIAL NUMBER: 09/989,486                 ) Before the Board  
   )  
   ) of Appeals  
FILED: November 20, 2001                 )  
   )  
   ) Appeal No.  
FOR: REAR STEERING SENSOR                 )  
DIAGNOSTIC ALGORITHM                     )  
FOR FOUR-WHEEL STEERING                 )  
SYSTEMS                                     )

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APPEAL BRIEF

REAL PARTY IN INTEREST

The real party in interest is DELPHI TECHNOLOGIES, INC., the assignee of recorded dated 11/20/2001, reel / frame 012317 / 0411.

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

STATUS OF CLAIMS

Claims 2 – 6 and 20 have been allowed.

Claims 7 – 14 stand objected to.

Claim 16 has been cancelled.

Claims 1, 15, and 17 - 19 stand rejected.

The rejection of claims 1, 15, and 17 - 19 is herein appealed.

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STATUS OF AMENDMENTS

The Amendment After filed April 28, 2006 has been considered as indicated in the Advisory Action dated May 15, 2006, whereby the status of the claims was corrected, and, is now as indicated above.

SUMMARY OF CLAIMED SUBJECT MATTER

A concise explanation of the subject matter defined in each of the independent claims 1, 15, and 17 - 19 involved in the appeal is provided below:

Claims 1, 15, 17 – 19 are directed generally to validating a rear steering angle of a vehicle, with claim 1 reciting a method, claim 15 reciting a storage medium, claim 17 reciting a steering system, and claim 18 reciting a controller for a rear-wheel steering system.

Each of these claims 1, 15, 17 – 19 includes the common recitations discussed below.

The “receiving a plurality of signals indicative of said rear steering angle”, is described in an exemplary embodiment as “the rear-wheel angle is measured by a rear-wheel-angle sensor that produces output signals …”, see paragraph 0018 of the application.

The “checking at least one of said plurality of signals to determine if it falls within a valid range” is described in an exemplary embodiment as “[t]he diagnostics implemented in this algorithm determine whether signal-1 and signal-2 are each in a specified range …”, see paragraph 0018 of the application.

The “correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is invalid”, is described in an exemplary embodiment as “[t]he algorithm also checks the correlation between signal-1 and signal-2 to determine whether the signals are shorted to each other or otherwise incongruent …”, see paragraph 0018 of the application.

The “signaling a rejection if any of said plurality of signals is found to be invalid”, is described in an exemplary embodiment as “[i]f signal-2 is not within the valid range ...  
... a function 73 produces a signal indicative of a rear sensor

signal-2 out-of-range fault...”, see paragraph 0021 of the application, and “[i]f signal-1 is not within the valid range ... ... a function 92 produces a signal indicative of a rear sensor signal-1 out-of-range fault...”, see paragraph 0028 of the application.

Claim 17 further recites “at least one actuator in operable communication with a pair of rear wheels”, which is described in an exemplary embodiment as “the rear steering mechanism 16 further comprises a mechanism...”, see paragraph 0014 of the application

The above exemplary embodiments are discussed with respect to the aforementioned independent claims by way of example only and are not intended to in any way limit the scope of these claims.

#### GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1, 15, and 17 – 19 have been rejected as being allegedly unpatentable over Eguchi. The rejection of claims 1, 15, and 17 – 19 as being allegedly unpatentable over Eguchi is to be reviewed on appeal.

#### ARGUMENT

In the Final Office Action dated March 1, 2006, the Examiner cites column 1, lines 18 – 45 of Eguchi, which is the Description of Background Art, namely a discussion of Japanese Patent Application First Publication No. Showa 63-82875 published April 13, 1988. The Examiner states that Eguchi is deficient, in that, it fails to teach, “signals a rejection if any of the plurality of signals is found to be invalid”. The applicants agree. However, the cited reference is further deficient, in that, it fails to teach “receiving a plurality of signals indicative of said *rear* steering angle”, emphasis added, as recited by the claims on appeal.

More specifically Eguchi teaches, “in which an occurrence in failure of a steering angle sensor used in a power assisted control for the steering of *front* road wheels ...”, see column 1, lines 21 – 24 of Eguchi, emphasis added. This is further supported in U.S. Patent No. 4,972,320 (which was previously submitted in an Information Disclosure Statement) which is the U.S. Patent corresponding to Japanese Patent Application First Publication No. Showa 63-82875 published April 13, 1988. The Examiner is incorrect in

stating, "Eguchi discloses receiving a plurality of signals indicative of the *rear* steering angle ...", page 2, section 5 of the Office Action dated September 13, 2005, emphasis added. Clearly, Eguchi's teaching with respect to a front wheel steering assist system has no relevance to validating a rear steering angle as recited by the claims on appeal.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Establishing a *prima facie* case of obviousness requires that all elements of the invention be disclosed in the prior art. *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970). Further, even assuming that all elements of an invention are disclosed in the prior art, an Examiner cannot establish obviousness by locating references that describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would have impelled one skilled in the art to do what the patent applicant has done. *Ex parte Levengood*, 28 U.S.P.Q. 1300 (Bd. Pat. App. Int. 1993). The references, when viewed by themselves and not in retrospect, must suggest the invention. *In Re Skoll*, 187 U.S.P.Q. 481 (C.C.P.A. 1975).

Section 103 sets out the test for obviousness determinations. It states, in pertinent part, that such determinations are to be made by consideration of

... the differences between subject matter sought to be patented and the prior art such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the [pertinent] art.

In applying Section 103, the U.S. Court of Appeals for the Federal Circuit has consistently held that one must consider both the invention and the prior art "as a whole," not from improper hindsight gained from consideration of the claimed invention. See, *Interconnect Planning Corp. v. Feil*, 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) and cases cited therein. According to the *Interconnect* court

[n]ot only must the claimed invention as a whole be evaluated, but so also must the references as a whole, so that their teachings are applied in the context of their significance to a technician at the time - a technician without our knowledge of the solution.

*Id.* Also critical to this Section 103 analysis is that understanding of "particular results" achieved by the invention. *Id.*

In response to the above argument the Examiner stated in the Final Office Action dated March 1, 2006 that (1) "how the system operates is irrelevant to what axle the invention is installed on", (2) "the fact that Eguchi cites this invention as background of his invention of a rear wheel steering system is an implicit acknowledgement that the front wheel system of the background could be used on a rear wheel system", and (3) "when a vehicle is driven in reverse, the front wheels and rear wheels trade places so any vehicle with the system disclosed in the background of the invention would read on the current invention when the vehicle is driven in reverse".

Regarding (1) "how the system operates is irrelevant to what axle the invention is installed on". Which axle is important to the present invention as recited by the claims on appeal, as it is directed to "a rear steering angle of a vehicle". For most vehicles only the front wheels steer, however the present invention is directed to vehicles where the rear wheels also steer. This is an important limitation.

Regarding (2) "the fact that Eguchi cites this invention as background of his invention of a rear wheel steering system is an implicit acknowledgement that the front wheel system of the background could be used on a rear wheel system". More specifically, The Examiner is referring to the front wheel system of the Japanese Patent Application First Publication No. Showa 63-82875. There is simply no motivation to use the front wheel system of the Japanese Patent Application First Publication No. Showa 63-82875 on the rear wheels. In fact, Eguchi teaches that the front wheel system of the Japanese Patent Application First Publication No. Showa 63-82875 is not suitable for the rear wheels, see generally column 6, lines 17 – 57 of Eguchi. In light of these teachings, the only suggestion to install the front wheel system of the Japanese Patent Application First Publication No. Showa 63-82875 on the rear wheels is by the Examiner using the present invention, i.e., an improper hindsight rejection.

Regarding (3) "when a vehicle is driven in reverse, the front wheels and rear wheels trade places so any vehicle with the system disclosed in the background of the invention would read on the current invention when the vehicle is driven in reverse". This is simply not true. The rear of the vehicle is the rear of the vehicle, whether it is traveling forward or in reverse. The physical configuration of the vehicle does not change because of the direction of travel.

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For at least these reasons, claims 1 and 15 – 19 patentably defines over Eguchi.

**CONCLUSION**

In view of the foregoing, it is urged that the final rejection of claims 1 and 15 – 19 be overturned. The final rejection is in error and should be reversed.

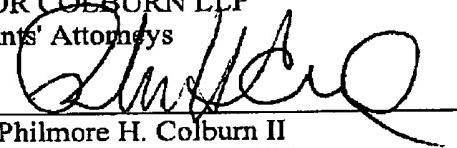
The fee as set forth in 37 CFR § 41.20(b)(2) can be charged to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

If there are any charges with respect to this Appeal Brief or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

Respectfully submitted,  
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CLAIM APPENDIX

Claim 1. A method for validating a rear steering angle of a vehicle, comprising:  
receiving a plurality of signals indicative of said rear steering angle;  
checking at least one of said plurality of signals to determine if it falls  
within a valid range;  
correlating at least a first signal of said plurality of signals with at least a  
second signal of said plurality of signals to determine if either said first signal or said  
second signal is invalid; and  
signaling a rejection if any of said plurality of signals is found to be  
invalid.

Claim 2. A method for validating a rear steering angle of a vehicle, comprising:  
receiving a plurality of signals indicative of said rear steering angle;  
checking at least one of said plurality of signals to determine if it falls  
within a valid range;  
correlating at least a first signal of said plurality of signals with at least a second  
signal of said plurality of signals to determine if either said first signal or said second  
signal is invalid;  
signaling a rejection if any of said plurality of signals is found to be  
invalid, wherein said correlating includes comparing said first signal with an expected  
value at about an inflection point of said second signal.

Claim 3. A method as defined in Claim 2, said correlating further comprising:  
adding a second rear-wheel angle offset corresponding to said inflection  
point to a signal corresponding to said second signal in response to said comparing.

Claim 4. A method as defined in Claim 3, said correlating further comprising:  
subtracting a center value from said second signal; and  
multiplying a result of said subtracting by a scale factor.

Claim 5. A method as defined in Claim 3, further comprising:  
computing said expected value with reference to a look-up table.

Claim 6. A method as defined in Claim 3, further comprising:  
computing said expected value by evaluating a continuous function.

Claim 7. A method as defined in Claim 1, said correlating comprising:  
calculating a steering angle corresponding to one of said first signal and  
said second signal so as to create a calculated angle; and  
computing an expected value of the other of said first signal and said  
second signal in accordance with said calculated angle.

Claim 8. A method as defined in Claim 7, said correlating further comprising:  
comparing said expected value of said other of said first signal and said  
second signal with an actual value of said other of said first signal and said second signal.

Claim 9. A method as defined in Claim 8, said correlating further comprising:  
determining that any of said plurality of signals is invalid if said expected  
value and said actual value are not substantially equivalent.

Claim 10. A method as defined in Claim 7, wherein at least one of said  
calculating and said computing further comprises using a look-up table.

Claim 11. A method as defined in Claim 7, wherein at least one of said  
calculating and said computing further comprises evaluating a continuous function.

Claim 12. A method as defined in Claim 1, wherein said plurality of signals  
comprises a plurality of signal components of a single carrier signal.

Claim 13. A method as defined in Claim 1, wherein said receiving further  
comprises providing a single sensor having two signal outputs.

Claim 14. A method as defined in Claim 1, wherein said checking further comprises:

comparing at least one of said plurality of signals with an upper limit; and  
comparing at least one of said plurality of signals with a lower limit.

Claim 15. A storage medium encoded with a machine readable computer program code comprising:

computer code for receiving a plurality of signals indicative of a rear steering angle;

computer code for checking at least one of said plurality of signals to determine if it falls outside a valid range and is invalid;

computer code for correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is invalid; and

computer code for signaling a rejection if any of said plurality of signals are found to be invalid.

Claim 16. (Cancelled)

Claim 17. A rear steering system for a vehicle, comprising:

at least one actuator in operable communication with a pair of rear wheels;  
and

a controller operably interconnected with said actuator; a  
means for receiving a plurality of signals indicative of a rear steering angle of said rear wheels;

means for checking at least one of said plurality of signals to determine if it falls outside a valid range and is invalid;

means for correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is invalid; and

means for signaling a rejection if any of said plurality of signals are found to be invalid.

Claim 18. A controller for a rear-wheel steering system, the controller comprising:

means for receiving a plurality of signals indicative of a rear steering angle;

means for checking at least one of said plurality of signals to determine if it falls outside a valid range and is invalid;

means for correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is invalid; and

means for signaling a rejection of any if said plurality of signals are found to be invalid.

Claim 19. A controller for a rear-wheel steering system, the controller comprising:

at least one input terminal for receiving a plurality of signals indicative of a rear steering angle;

at least one comparator for checking at least one of said plurality of signals to determine if it falls outside a valid range and is invalid;

at least one correlation function for correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is invalid; and

at least one output terminal for signaling a rejection if any of said plurality of signals are found to be invalid.

Claim 20. A method for determining a steering angle comprising:

- receiving a plurality of signals indicative of said steering angle;
- checking at least one of said plurality of signals to determine if it falls within a valid range;
- correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine that neither said first signal nor said second signal is invalid;
- determining a first value of said steering angle in accordance with said first signal; and
- determining a second value of said steering angle in accordance with said first value of said steering angle and said second signal in order to obtain a more accurate measurement.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None